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Claims

1. A process for performing a coupling reaction between acetaldehyde and a terminal alkyne to yield a hydroxyalkyne comprising the steps of;

   (i)   reacting without solvent, a terminal alkyne with a Lewis acidic metal salt in the presence of an alkanolamine ligand and a cyclic amine base to form a metal-alkyne complex, and

   (ii)   adding a solution of acetaldehyde to the metal-alkyne complex.

2. A process according to claim 1 wherein the terminal alkyne is of general formula $R^1R^2C(OH)C{\equiv}CH$ in which R^1 and R^2 may be the same or different and are selected from the group comprising methyl, ethyl and propyl.

3. A process according to claim 1 or claim 2 wherein the Lewis acidic metal salt is zinc triflate.

4. A process according to any one of claims 1 to 3 wherein the alkanolamine ligand is a chiral β-alkanolamine having a tertiary amine group.

5. A process according to any one of claims 1 to 4 wherein the alkanolamine ligand is (+)- or (-)-N-methylephedrine.

6. A process according to any one of claims 1 to 5 wherein the cyclic amine base is selected from the group comprising 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU), 1,5-diazabicyclo-[4.3.0]non-5-ene and 1,4-diazabicyclo[2.2.2]octane.

7. A process according to any one of claims 1 to 5 wherein the acetaldehyde concentration is between 0.1 and 2 moles/litre.

8. A process according to any one of claims 1 to 7 wherein step (ii) is performed at –20 to 25°C over a period of 3 to 10 hours.

9. A process according to any one of claims 1 to 8 wherein the molar ratio of the Lewis acidic metal salt : acetaldehyde is 1.5:1, the molar ratio of cyclic amine base: acetaldehyde is 1.6:1 and the molar ratio of alkanolamine ligand to acetaldehyde is 1.6:1.

10. A process according to any one of claims 2 to 9 wherein the reaction product of the coupling reaction is subjected to a thermal fragmentation reaction to yield a terminal alkyne.